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A Road Problem: Roman or Byzantine ?

Tafel 49

In selecting the title for this contribution, I have attempted to draw attention, once again, to the theme admirably discussed by Richard Bulliet in his (by now) classic work, *The Camel and the Wheel* (1975). His subject¹ is elegantly simple: the Roman Empire made use of wheeled vehicles, Arab culture did not. It is not my purpose here to answer the problem, Why? but rather to answer the parallel question, When?

At the same time, I wish also to outline a methodological ambiguity in the volumes of the TIB (*Tabula Imperi Byzantini*). This series is concerned with the topography of the Byzantine Empire. The roads indicated on the maps drawn for each volume are for the most part (if not entirely) Roman, not Byzantine. The evidence for the course of each road is supported by milestones and *itineraria*. There is, therefore, an implicit acceptance that by natural process, a *Roman* road became, or was transformed into a *Byzantine* road. Or, to put the matter differently, the existence and topography of a *Byzantine* road-network is supported by the evidence from the *Roman* period. Nowhere in the TIB is the notion of an hereditary relationship (if any), between Roman and Byzantine roads, unambiguously stated and critically examined.

Indeed, can such a direct sequence, Roman and Byzantine, be materially tested?

In order to make some attempt to do so, I refer here to three ancient routes, two in Asia Minor and one in Syria. In illustrating the chronological position of these, I emphasize a basic proposition², namely, the distinction between vehicular and non-vehicular roads. This distinction, current in the Roman Imperial period, provides the basic, technological background to the later transition from wheel to pack-animal as a means of transport.

Some epigraphic evidence points to fifth and sixth century road-activity. Is this, then, the period of transition which is implied by (although not stated in) Bulliet's exposition? Are there Byzantine roads which reflect the nature of the transition? Does the existence of such roads confirm the theoretical foundation of the TIB?

I am grateful to Professor Wolfgang Blümel for permission to quote his unpublished milestone found in the region of Barylia.

- 1) Discussed also by R.J. Forbes, *Studies in Ancient Technology* 2 (1955) 187-228.
- 2) D.H. French in: ANRW 7,2 (1980) 698-729.

THE MATERIAL EVIDENCE

First, the roads.

1. Antiochia-Beroea and Chalcis road in N Syria.

Certainly the best known³ of all paved roads in the Near East. The best preserved stretch runs over a low, limestone ridge straight through the middle of the small village of Karimi (c. 35 km. due W of Aleppo). The road is visible on the top and on the slopes of this ridge but disappears below ground surface in the valleys on either side, to north and south. It has been frequently illustrated. In all publications the road has been dated to the Roman period. There is no reason to doubt that it formed part of the route from Antiochia to Beroea (Aleppo) and to Chalcis (the route divides at el-Terib, ancient Litarba⁴, c. 7 km. SE of Karimi). The construction⁵ of the road is excellent: large, deep blocks of limestone, carefully laid and set, those at the edge being fitted in a near-regular header-and-stretcher technique⁶. There is no raised kerb. The width, though varying, is well in excess of 3.25 m. (the standard⁷ adopted for a 'roadway', a non-vehicular road) but somewhat less than 6.50 m. (the standard adopted for a 'highway', a two-lane, vehicular road). The road is built (in some sections) over bed-rock and (in other sections) over a pre-existing road-surface (the earlier road is visible on the lower, right-hand side of the later road in the photograph (*Pl. 49,1*) and in the second photograph (*Pl. 49,2*) immediately below the

- 3) C. Ritter, *Die Erdkunde oder allgemeine vergleichende Geographie* 17 (Syrien) I–II (1854–55) 1662; H.C. Butler, *Architecture and other arts*. Publ. Amer. Arch. Exped. to Syria 1899–1900 II (1903) 29, 57–58; J.R. Metheren, *Journal of the American Oriental Society* 28, 1907, 155; H.C. Butler, *Ancient Architecture in Syria*. Publ. Princ. Univ. Arch. Exped. to Syria 1904–1905 and 1909 II, B, 4 (1910) 152; H.C. Butler, *Ancient Architecture in Syria*. Publ. Princ. Univ. Arch. Exped. to Syria 1904–1905 and 1909 II, B, 5 (1912) 214; Fr. Cumont, *Études syriennes* (1917) 9–11; R. Dussaud, *Topographie historique de la Syrie antique et médiévale* (1927) 220; A. Poidebard, *Syria* 10, 1919, 26–27 and Pl. 8; R. Dussaud, P. Deschamps and H. Seyrig, *La Syrie antique et médiévale illustrée* (1931) Pl. 61 and text; RE IV A,2 (1932) 1657–1659 s.v. Syria (Itinerarien u. Römerstraßen) (Honigmann); A. Poidebard, *Le trace de Rome dans le désert de Syrie* (1934) Pls. 156 and 157; R. Mouterde – A. Poidebard, *Le limes de Chalcis* (1945) 38; A.A.M. van der Heyden – H.H. Scullard, *Atlas of the Classical World* (1959) 117 no. 291; V.W. von Hagen, *The Roads that led to Rome* (1969) photo. (p. 140); V.W. von Hagen, *Roma nel Mondo* (1969) Chapter I, colour photo Pl. 6; T.S.R. Boase, *The Cilician Kingdom of Armenia* (1971) 64 Fig. 41; L. Casson, *Travel in the Ancient World* (1974) 169 and Fig. 7; J. Maenecill, *Zeitschr. f. allgemeine Erdkunde* 4, p. 8 Pl. 4 (non vidi) (cited by Honigmann loc.cit. 1658).
- 4) H.C. Butler (*Ancient Architecture in Syria*. Publ. Princ. Univ. Arch. Exped. to Syria 1904–1905 and 1909 II, B, 3 [1909] 152) rightly states that the road, Antiochia-Beroea and Chalcis, divided at el-Terib (ancient Litarba) but A. Poidebard, *Le trace de Rome dans le désert de Syrie* (1934) Map shows the road dividing at Kefr Kermin. On a later version R. Mouterde – A. Poidebard, *Le limes de Chalcis* (1945) 38, indicate (correctly) the road dividing at el-Terib.
- 5) Description, plan and section in A. Poidebard, *Syria* 10, 1919, 26–27 Fig. 2; repeated A. Poidebard, *Le trace de Rome dans le désert de Syrie* (1934) Pls. 156 and 157. Poidebard does not recognize the stones below the *later* (existing) road as part of the *earlier* (buried) road, despite the observable lack of alignment (*Pl. 49,2*) and the intermittent survival of the underlying layer. The (earlier) stones in the photographs (*Pl. 49,1,2*) though present and visible on the N are absent on the S side of the (later) road. However, I could not see (09.04.92) all that Poidebard (loc.cit.) described.
- 6) See the (schematic) drawing in A. Poidebard, *Syria* 10, 1919, 27 Fig. 2; repeated A. Poidebard, *Le trace de Rome dans le désert de Syrie* (1934) Pl. 157.
- 7) For the significance, see footnote 2 above.

blocks of the later road). The earlier road protrudes slightly from the edge of the later road but in general the later road is seated squarely on top of the earlier surface. No ruts are visible. The road is not stepped. There is no central spine. There are signs of the later repair.

2. *The Tarsus-Podandus road in Cilicia*

The best preserved section of this road can be found c. 1 km. N of Sağlıklı village (c. 14 km. due N of Tarsus). Thankfully it has not been lost (unlike other sections of the route) to the new Pozanti-Tarsus motorway but the arch (*Pl. 49,3*) has collapsed (c. 2–3 years ago?) owing to the use of dynamite in nearby quarries. The road has been mentioned and illustrated several times⁸ but, in general, is not well known. It has been dated to the Roman period. The arch over the road has attracted some comment⁹. The construction of the road is good. The blocks of the surface were carefully cut and laid (the regularity of the setting is visible in the photograph (*Pl. 49,3*), lower, right-hand corner). There is no evidence of any edging-technique (such as the headers and stretchers of the Antiochia-Beroea road) but the raised kerb is a striking feature. An earlier road is not apparent but there are signs of repair to the existing road. The road is stepped. Ruts are not present nor is there a central spine. The general width of the road is c. 3.00–3.50 m. (including kerb stones). The road can be defined as a 'roadway' on the basis of the width and the presence of steps.

The Tarsus-Podandus road was passable by vehicles as late as the mid-fourth century AD (Julian, AD 362: *Amm. Marc. 22,9,13*).

3. *The Via Sebaste route from Pamphylia to Pisidia*

Excellently preserved, this road could easily become a worthy touristic monument. It is to be found in the defile c. 4 km. NNE of Kovanlık village (in the upper Pamphylian plain, c. 30 km. NNW of Antalya). The road runs from Perge and/or Attalia through the Taurus mountains to the uplands of Pisidia. Eventually it came to Colonia Antiochia. The name of the road, *Via Sebaste*, is given on a milestone¹² preserved at the top of the defile through which the road is obliged to pass¹¹.

- 8) V. Langlois, *RA* 13, 1856, 481 Pl. 294; C. Ritter, *Die Erdkunde* etc. 18 (Kleinasien), 1–2 and 19,2 (Kleinasien) (1858–59) 225 (non vidi); V. Langlois, *Voyage dans la Cilicie et dans les montagnes du Taurus, exécuté pendant les années 1852–1853* (1861) 365 Pl. 24; W.M. Ramsay, *BCH* 22, 1898, 237–238; W.M. Ramsay, *Pauline and Other Studies* (1906) 94–95 Pl. 2; W.M. Ramsay, *The Cities of St. Paul* (1907) 280 Pls. 11 (no. 17) and 12 (nos 18–19); D.H. French, *Roman Roads and Milestones of Asia Minor I* (1981) 19 n. 6; H. Hellenkemper – F. Hild, *Neue Forschungen in Kilikien* (1986) 96–97 Pls. 139–140.
- 9) W.M. Ramsay, *BCH* 22, 1898, 237; D. Magic, *Roman Rule in Asia Minor 2* (1950) 1154; H. Hellenkemper – F. Hild, *Neue Forschungen in Kilikien* (1986) 96 n. 42.
- 10) D.H. French, *VIII. Araştırma Sonuçları Toplantısı* (1990) 235 Fig. 12.
- 11) E.J. Davis, *Anatolica* (1874) 200–202; K. von Lanckoronski, *Städte Pamphyliens und Pisidiens II* (1892) 123–124; F. Stark, *Alexander's Path* (1958) 98, 255 and Pl. (p. 204); V.W. von Hagen, *Roma nel Mondo* (1969) Chapter III 'Asia' photos Pls. 17 and 22.

The road is well constructed but the surface-blocks, though large and deep, are not regular nor, though carefully laid, are they perfectly fitted. Larger blocks form the edge. There is evident use of spolia (sarcophagus and column fragments, shaped blocks) and also of earlier road-bedding. Re-used blocks bearing the marks of wheels, i.e. ruts, are visibly frequent. The road is c. 3.00–3.50 m. wide and stepped. There are no ruts nor is there a central spine. The road is clearly the latest (indeed the last) of several.

Not only is there the evidence of spolia from earlier roads (i.e. blocks revealing the traces of a wheel-rut) but there is also openly visible the presence of vertical stratification. In one stretch (not illustrated here) at least four different surfaces can be counted¹². In the photograph (Pl. 49,4) (taken at the top of the defile) three roads are discernable. One road (the oldest) (nearest the camera) passes beside an Ottoman *sarnıç* (cistern)¹³. The edge of the next, younger surface¹⁴ is visible two metres to the E. The latest¹⁵ (i.e. the youngest) (furthest from the camera) was constructed over the top of the two earlier surfaces. It passes the foot of the Hellenistic tower. At a short distance southwards below the top of the defile a small church or chapel was built beside the road: it relates only to the latest construction. The position of the church provides a valuable *terminus a quo*. The earliest road was constructed under Augustus: the latest in the (?) Byzantine Period. All others must fall between these two limits.

EPIGRAPHIC EVIDENCE

No inscription describing construction or paving is associated with these three roads. A milestone¹⁶ may *perhaps* record a repair to the Döşeme Boğazı road under Septimius Severus.

COMMENTARY

The starting-point for any chronological discussion (of these roads) must be the Döşeme Boğazı. Here we have a stratified sequence of road-construction. Setting aside the 'pre-history' (as it were) of the route, the first indications of road-building point to the early Roman period, perhaps late-republican, certainly early-principate. The earliest Roman road or roads (whether republican or principate or both) were most probably 'highways' i.e. vehicular roads. There are rock-cuttings which I associate with the earliest Roman road. More particularly, however, there

12) D.H. French, VIII. Araştırma Sonuçları Toplantısı (1990) 234.

13) In the photograph (Pl. 49,4) the cistern is concealed behind the tree on the left-hand side.

14) In the photograph (Pl. 49,4) the front animal (in fact a black bullock) stands on this road; behind and to the left of the animal can be seen the edge-stones (shadowed) of the second road.

15) In the photograph (Pl. 49,4) behind and left of the front animal there is a second animal; this animal is standing on the latest road; the shadow on the edge-stones on the righthand middle-ground marks the W edge of the latest road.

16) D.H. French, VIII. Araştırma Sonuçları Toplantısı (1990) 235 (notice only). Unfortunately the lower lines of the text are lost.

17) D.H. French, IX. Araştırma Sonuçları Toplantısı (1991) 155 Pls. 11–12.

are the *spolia* blocks bearing traces of wheel-ruts. Built into the *latest* road, they belong (in my opinion) to the *earliest* road which was dismantled when later repairs or constructions were carried out. It is significant that frequently the alignment of the *earliest* road was abandoned by the *latest* road. The rock-cuttings and surviving blocks of the *earliest* road can be observed on either side of the *latest* road (as in the photograph, Pl. 49,3). At the northern end of the defile the *earliest* road, complete with wheel-ruts, was discarded in favour of a wholly new alignment¹⁷.

In Asia Minor, as is evident by comparison with other roads, there is the strongest possible contrast in constructional style between the normal Roman road¹⁸ and the roads at Tarsus and the Döşeme Boğazı. Indeed, the contrast can be observed in the Döşeme Boğazı itself¹⁹. This same contrast I have observed on the *Via Egnatia* in Macedonia²² and Thrace²¹.

The description of Justinian's rebuilding of the *Via Egnatia* at Rhegium near Constantinopolis is, therefore, particularly apposite. The situation described by Procopius (App. 2) indicates that in the Justinianic period, at least, a road of heavy, deep, well fitted blocks replaced an earlier construction, the style of which, although not indicated by Procopius, was almost certainly that which I myself have observed in Thrace²², namely a road of large, irregular edge-stones with a fill of rough field stones divided by a central spine. This is the style adopted for Roman roads in Macedonia and Thrace, Asia Minor and Syria²³.

Repairs and re-constructions can be observed at several points along the Döşeme Boğazı. One of these repairs may perhaps have taken place under Severus²⁴. There is no further evidence for the date of the latest road. The church or chapel (mentioned above) beside the latest road provides some (if uncertain) indication of a date not earlier than Constantine (i.e. the first half of the fourth century AD), most probably in the sixth or seventh centuries.

My own estimate of the date (of all three roads) would be the period AD 500–625. The grounds of this suggestion are indirect and insubstantial:

- 18) Drawings of a 'highway' in Asia Minor: (1) D.H. French in: ANRW 7,2 (1980) 713 Diagram 6; (2) D.H. French, Roman Roads and Milestones of Asia Minor I (1981) 20 Figs. 1–2; (3) D.H. French, Anadolu Medeniyetleri Müzesi Yıllığı, 1990, Figs. 2a.c. 3a. Photographs of a 'highway' in Asia Minor: (1) D.H. French in: ANRW 7,2 (1980) Pls. 1–2; (2) D.H. French, Anadolu Medeniyetleri Müzesi Yıllığı, 1990, Pl. 2; (3) D.H. French, IX. Araştırma Sonuçları Toplantısı (1991) 155 Pls. 11–12. Photographs of a 'highway' in Syria: (1) A. Poidebard, Le trace Rome dans le désert de Syrie (1934) Pls. 26, 138, 158; (2) R. Mouterde – A. Poidebard, Le limes de Chalcis (1945) Pl. 6,1; 17; 28; (3) A.A.M. van der Heyden – H.H. Scullard (eds), Atlas of the Classical World (1959) 117 no. 290; (4) D.L. Kennedy and D. Riley, Rome's Desert Frontier (1990) Figs. 24, 26, 29, 31, esp. 32. Photograph of a 'roadway' in Syria: R. Mouterde – A. Poidebard, Le limes de Chalcis (1945) Pl. 29.
- 19) Compare the 'roadway' (D.H. French, IX. Araştırma Sonuçları Toplantısı (1991) Pls. 8–10) with the 'highway' (Ibidem 155 and Pls. 11–12).
- 20) The 'roadway' (i.e. non-vehicular road) at Cavalla (T. Cornell – J. Matthews, Atlas of the Roman World (1982) photo on p. 147; V.W. von Hagen, Roma nel Mondo (1969) 153 Fig. 1 of Chapter IV 'Graecia-Dacia et Pannonia').
- 21) The *Via Egnatia*, on the E side of the modern road, between Alexandroupolis and Pherai; visible as a 'highway' i.e. large but irregular edge-stones, central spine and rough surface of field-stones; there is a touristic sign-post at the best preserved section.
- 22) See footnote 21 above.
- 23) See footnote 18 above.
- 24) See footnote 16 above.

- 1 an inscription²⁵ relating to the Tarsus – Seleucia ad Calycadnum route (along the Mediterranean coast, through Pompeiopolis, Elacussa and Corycus) records the refurbishment of the road under Justin I in AD 521.
- 2 at least two milestones²⁶ (from the region of Halicarnassus in Caria) record road activity (erection of the milestone? repairs?) under Anastasius I (AD 491–518).
- 3 a new milestone²⁷ (from the region of Bargylia, again in Caria) records the renewal of milestones under Justin I (AD 518–527).
- 4 Procopius records road-activities under Justinian (AD 527–565) both in general (*de Aedificiis* 5.1.3) (see below, App. 1) and in particular, as follows:
 - a (*de Aedificiis* 4.8–4.9) (see below, App. 2) the repair and re-building of the *Via Egnatia* near Rhegium (close to Constantinopolis)²⁸.
 - b (*de Aedificiis* 5.2.12) (see below, App. 3) the building of a road in the mountains of Bithynia near the river Dracon (close to Nicaea); the road was passable by carts,
 - c (*de Aedificiis* 5.3.12–15) (see below, App. 4) the building of a new road between Bithynia and Phrygia (under Justinian and Theodora) (AD 527–548),
 - d (*de Aedificiis* 5.4.1–3) (see below, App. 5) the restoration of a road through the mountains from Antiochia to Cilicia; the road was made passable (?once more) by carts.

This literary evidence cannot demonstrate a conclusive date for the construction of the Döşeme Boğazi road. It does, however, confirm (1) that Roman roads were maintained in the early Byzantine period (at least) and (2) that the requirement and use of vehicular roads continued into the Byzantine period, at least until the sixth century. Justinian's activities, therefore, provide a *terminus post quem* for the introduction of non-vehicular roads. The *terminus ante quem* is given by the Selcuk conquest which introduced a road-system based on new administrative centres and on new transport conditions and requirements, namely (as Bulliet pointed out) the use of pack-animals, *par excellence* the camel²⁹.

25) T.S. and P.A. MacKay, *AnatSt* 9, 1969, 139 no. 1; D.H. French in: *ANRW* 7,2 (1980) 726 no. 34.

26) D.H. French, *Roman Roads and Milestones of Asia Minor* 2,1 (1988) 845 and 848.

27) Information of Professor W. Blümel.

28) The description of the earlier road near Rhegium recalls that given by Julian (Letters no. 98) (ed. Bidez 1924) (quoted by Cumont, *Études syriennes* [1917] 7–8 and re-quoted by A. Poidebard, *Syria* 10, 1929, 28) which I translate below (see App. 6). H.C. Butler, *Ancient Architecture in Syria*. Publ. Princ. Univ. Arch. Exped. to Syria 1904–1905 and 1909 II, B, 3 (1909) 113 referred to 'country roads' but the road described by Julian reflects the constructional technique of the standard 'highway' in Asia Minor (see footnote 18 above).

29) Hans were built for the safe housing of camels and drivers. In the Selcuk period, the route from Antalya to Burdur crossed the Taurus mountains not by the Döşeme Boğazi but by the Çubuk Boğazi, some 8 km. to the W. The Selcuk han (Kırkgöz Hanı: K. Erdmann, *Das anatolische Karavansaray des 13. Jahrhunderts I* [1961] 179 no. 56) lies at the southern exit of the Çubuk Boğazi.

For the introduction and use of camels and/or dromedaries in Asia Minor and in the Early Byzantine period, see the important comment on camels and camel-drivers in sixth century Galatia (S. Mitchell, *AnatSt* 27, 1977, 97–98 with references to bibliography on camels) and the note (G. Dagron and J. Rougé, *REByz* 40, 1982, 126, quoting and expanding the above) which describes a mid-fifth century source (a horoscope of AD 451) for the importation of (North?) African camels to Athens.

THE CHRONOLOGY OF THE DÖŞEME BOĞAZI, TARSUS AND ALEPPO ROADS

Can the three roads be technically and chronologically related? Any answer must be based on a convergence of similarities:

- 1 Construction: all three roads are similar in appearance but differ in details (such as the presence/absence of kerb-stones, the quality of workmanship³⁰, use of steps, the absence of a central spine). On the other hand, the width of the roads is not sharply different. In two cases (certainly) (Döşeme Boğazı and Aleppo) the road is laid over an earlier surface.
- 2 Use: there is no evidence of wheel-ruts³¹ on any of the three roads. These are 'roadways', non-vehicular roads.

In my opinion, these three roads can be considered contemporary. This conclusion would remove the Aleppo road from the Roman to the Byzantine world³². Furthermore the association of the Aleppo and Tarsus roads with the Döşeme Boğazı would bring down even lower the upper chronological limit for the introduction of non-vehicular roads from the eleventh century (the Selcuk conquest of Anatolia) to the seventh or eighth century (the Arab conquest³³ of Syria and then of Cilicia). In effect, therefore, the general introduction of non-vehicular roads ('roadways') could be dated to the years c. AD 500–625, although an earlier introduction is certainly possible in Syria and Cilicia as is a later introduction in Pamphylia.

30) The notably fine constructional style of the Aleppo road exactly matches the quality of workmanship to be seen in Late Roman and Early Byzantine masonry throughout N Syria.

31) For the striking aspect of wheel-ruts on Roman paved roads of the west: L. Casson, *Travel in the Ancient World* (1974) 170 Fig. 8 and V.W. von Hagen, *Roma nel Mondo* (1969) Fig. 4 of the chapter »Roman DLXXIX« at Donnaz in N Italy, V.W. von Hagen, *Roma nel Mondo* (1969) Chapter I Pl. 6 on the *Via Prenestina* and V.W. von Hagen, *Roma nel Mondo* (1969) Chapter I Pl. 10 on the *Via Iulia Augusta*.

32) If the Aleppo road is to be re-dated to the sixth or seventh century, then so too must the arch at Bab al-Hawa (G. Bell, *The Desert and the Sown* [1907] 297 and Fig. [p. 301]; H. C. Butler, *Ancient Architecture in Syria*. Publ. Princ. Univ. Arch. Exped. to Syria 1904–1905 and 1909 II, B, 3 [1909] 210; R. Garrett, *Topography and Itinerary*. Pub. Amer. Arch. Exped. to Syria 1899–1900 I [1914] 267; R. Dussaud, *Topographie historique de la Syrie antique et médiévale* [1927] 220; R. Dussaud – P. Deschamps – H. Seyrig, *La Syrie antique et médiévale illustrée* [1931] Pl. 62; G. Tchalenko, *Villages antiques de la Syrie du nord* I [1953] 114, and II [1953] Pl. 40). H. Hellenkemper and F. Hild, *Neue Forschungen in Kilikien* [1986] 97 n. 44 quote G. Tchalenko (loc.cit.) for the date, »frühbyzantinische Zeit«, of the arch (»... in das 6. Jahrhundert«). H. Hellenkemper – F. Hild, *Neue Forschungen in Kilikien* (1986) 97 compare the two arches, at Bab al-Hawa and Sağlıklı, in style and in date (»Die Bauausführung des Torbogens ist frühestens im 4., eher im 5./6. Jahrhundert erfolgt«). These views on the date of the arches coincide neatly with the re-dating of the roads. Indeed, they should coincide. The arch at Sağlıklı is adapted to the width of the road and must, therefore, be contemporary.

In view of the suggested re-dating of Aleppo and Tarsus roads (and arches), one may speculate whether or not the road and arch at Karanlıkkapı (H. Hellenkemper and F. Hild, *Neue Forschungen in Kilikien* [1986] 101–102 Pls. 158–159) could also be reconsidered. There are two buildings phases in the Karanlıkkapı arch: is the later phase Early Byzantine?

A triple arch over a road exists at İlyas near Burdur in SW Anatolia (G.E. Bean, *AnatSt* 9, 1959, 81).

33) For the Arab conquest of Syria and Cilicia, see *Encyclopedia of Islam* III (1971) 85–90 s.v. Halab (Sauvaget) and *Cambridge Medieval History* 41 (1966) 63 (Anastos).

In conclusion, one may insist that the dating (or rather the re-dating) of the Aleppo, Tarsus and Döşeme Boğazı roads should not be surprising. The post-Roman (i.e. post-Constantinian) period has been somewhat neglected, largely owing to the paucity of material evidence and observation. The chronological re-interpretation presented here allows some part of Byzantine road history to be given substance and even to be amplified. Furthermore the new material evidence and observations do emphasize

- 1 that there is a need for a closer definition of the roads presented in TIB and for a sharply focussed examination of the assumptions, theory and methodology embedded in the presentation of the TIB volumes,
- 2 that Bulliet's thesis regarding the introduction of pack-animal transport can be supported by current interpretations.

APPENDIX

APP. 1 Procopius *De Aedificiis* (ed. Loeb) 5.1.3

ἐν δέ γε τῷ παρόντι καὶ ὅσα κατὰ τὴν ἄλλην Ἀσίαν καὶ Λιβύην αὐτῷ εἰργασται ἢ τειχιζομένων ἢ τὰ κατὰ τὰς ὁδοὺς ἐπανορθοῦντι δυσπάρσιτα καὶ κινδύνων ἀτεχνῶς ἔμπλεα (πῇ μὲν ὁρῶν ἐπικειμένων κορημώδη ὄντα. πῇ δὲ ποταμοῦ γειτονίᾳ τοὺς παραπίπτοντας ἀποπνίγοντα), ...

So at present I shall tell also of all that was done by him in the rest of Asia and in Libya, either in fortifying, or in repairing the roads where they were difficult to travel and wholly beset with dangers (sometimes, because mountains towered above them, where they were too steep, sometimes where, since there was a river near by, travellers were caught in it and drowned), ...

APP. 2 Procopius *De Aedificiis* (ed. Loeb) 4.8.4–9

Φρούριόν ἐστιν ἐν προαστείῳ τῆς πόλεως. ὅπερ Στρογγύλον ὁμωνύμως τῇ τοῦ ἐρύματος συνθέσει καλοῦσιν. ἐντεῦθεν ἢ ἐξ τῷ Ῥήγιον ὁδὸς ἄγουσα. ἐκ τοῦ ἐπὶ πλείστον ἀνώμαλος οὖσα, ὁμβρων, ἂν οὕτω τύχοι, ἐπιπεσόντων, τελεματώδης τε καὶ δυσπάρσιτος τοῖς τῇδε ἰούσιν ἐγίνετο. νῦν δὲ λίθοις αὐτὴν καταστρώσας ἀμαξιαίοις ὁ βασιλεὺς οὗτος εὐπετὴ τε κατεστήσατο καὶ ἄπονον ὅλως. μῆκος μὲν τῇ ὁδῷ τῇδε ἄχρι ἐξ Ῥήγιον· εὐρύνεται δὲ τοσοῦτον ἐς ὅσον ἀμάξας οὐ στενοχωρεῖν δύο ἀπ' ἐναντίας ἀλλήλαις ἰούσας, τραχεῖς οἱ λίθοι διαφερόντως· εἰκάσαις ἂν αὐτοὺς μυλίας εἶναι· εὐμεγέθεις τέ εἰσι μάλιστα. ὥστε δὴ ἕκαστος γῆν μὲν ἐπικαλύπτει πολλήν, ἐς ἅγαν δὲ ὑψοῦ ἀνέχει. ἐς δὲ τό τε ὁμαλές καὶ τό γε λείον ἐπιεικῶς ἐξειργασμένοι. οὐκ ἐνήφθαι τῇ συνθέσει. οὐδέ πῃ ἐς τὸ ἀκριβές μεμυκέναι, ἀλλὰ συμπεφυκέναι δοκοῦσιν ἀλλήλοις. ταῦτα μὲν οὖν τοιαῦτά ἐστι.

In a suburb of the city there is a fortress which they call Strongylum from the form in which it is built. The road which leads from that point to Rhegium was for the most part uneven; and if rain chanced to fall it

became a bog and was difficult for travellers to get through. But now this Emperor has paved it with blocks of stone each large enough to load a waggon and so has made it altogether practicable and easy. In length, this road extends all the way to Rhegium and its breadth is such that two waggons, going in opposite directions, have no lack of room. The paving-stones are exceptionally coarse, so that you would suppose them to be mill-stones; and they are of goodly size. Consequently each one covers much ground and stands very high. They are very carefully worked so as to form a smooth and even surface, and they give the appearance not simply of being laid together at the joints, or even of being exactly fitted, but they seem actually to have grown together. So much, then, for this.

NOTE: The road described by Procopius has not been located.

APP. 3 Procopius *De Aedificiis* (ed. Loeb) 5.2.12–13

τὰ δὲ ὄρη κατὰ μέσον ἀποτεμών ἃ δὴ ἀνέχει ἀμφὶ τὰ ἐκείνη χωρία. ἐν ταῖς πρότερον ἀποτόμοις καὶ ζημινώδεσι χώραις ὁδὸν ἀμαξιτὸν ἐξεργάσατο. ταύτην τε τοῦ ποταμοῦ τὴν διάβασιν οὐκ ἀναγκαίαν ἐκ τοῦ ἐπὶ πλείστον τοῖς ἐνταῦθα οὔσι πεποιήκεν εἶναι. καὶ γεφύρας δύο ἐς ἅγαν εὐρείας τῷ ποταμῷ τοῦτῳ ἐντέθειται. καὶ ἀπ' αὐτοῦ ἀκινδύνως αὐτὸν διαβαίνουσι τὸ λοιπὸν ἅπαντες.

And he cut off in the middle the hills which rise there, and built a waggon-road in places which formerly were sheer and precipitous; and in this way he made the crossing of the river for the most part unnecessary for those who dwelt there. Also he placed two very broad bridges over this river, and in consequence everyone now crosses it without danger.

NOTE: There are reports of a paved road in the vicinity of Yalakdere, the probable location of the R. Dracon.

APP. 4 Procopius *De Aedificiis* (ed. Loeb) 5.3.12–15

Ἔστι δέ τις ἐν Βιθυνοῖς ὁδὸς ἐς τὰ Φρυγῶν ἥθη ἐνθὲνδε ἰόντι. ἐνθα δὴ ἀνθρώποις τε ἀναρίθμοις καὶ ζώοις ἑτέροις χειμῶνος ὥρα διολωλέναι ξυνέβαινε· γεώδης γὰρ ὑπεράγαν ἡ χώρα οὖσα, μὴ ὅτι ὄμβρων ἑξαίσιων καταρραγόντων ἢ χιόνων πολλῶν ἐπιχειμένων τε καὶ διαλυθεισῶν ἐν ἐσχάτῳ. ἀλλὰ καὶ ψεκάδων ἐπιπεπωκυῶν, ἃν οὕτω τύχη, ἐς τέλμα βαθὺ καὶ ἀπόρευτον ξυνισταμένη. τὰς τε ὁδοὺς τεναγώδεις ἐργαζομένη, τοὺς τῇδε ἰόντας ἐκ τοῦ ἐπὶ πλείστον ἀπέπνιγεν. ἀλλὰ καὶ τοῦτον αὐτὸς τε μεγαλοφροσύνη ψυχῆς καὶ ἡ βασιλὶς Θεοδώρα τὸν κίνδυνον τοῖς παριοῦσι διέλυσαν. ἐς ἡμέρας γὰρ ὁδοῦ ἥμισυ εὐζώνῳ ἀνδρὶ λίθοις παμιεγέθεσι σκέπας τῇ λεωφόρῳ ἀπεργασάμενοι ἐπὶ στεροῶς τῆς ὁδοῦ παρίεναι διεσκευάσαντο τοὺς τῇδε ἰόντας. ταῦτα μὲν Ἰουστινιανῷ βασιλεῖ ταύτη ἐξείργασται.

There is a certain road in Bithynia leading from there into the Phrygian territory, on which it frequently happened that countless men and beasts too perished in the winter season. The soil of this region is exceedingly deep; and not only after unusual deluges of rain or the final melting of very heavy snows, but even after occasional showers it turns into a deep and impassable marsh, making the roads quagmires, with the result that travellers on that road were frequently drowned. But he himself and the Empress Theodora, by their wise generosity, removed this danger for wayfarers. They laid a covering of very large stones over this highway for a distance of one half a day's journey for an unencumbered traveller and so brought it about that travellers on that road could get through on the hard pavement. These things, then, were done by the Emperor Justinian in this way.

NOTE: This road has not been identified.

APP. 5 Procopius *De Aedificiis* (ed. Loeb) 5.5.1–3

Ἐκ πόλεως δὲ Ἀντιοχείας, ἣ νῦν Θεοῦπολις ἐπικέκληται, ἐς Κίλικίαν ἰόντι παρ' αὐτὴν μάλιστα τὴν ὁδὸν προάστειόν ἐστι. Πλατανῶν ὄνομα ταύτης δὴ τῆς πόλεως οὐ πολλῷ ἄποθεν τρίβος τε ἦν ἐκ παλαιοῦ σφιγγομένη ἐκ τῶν παρατεταμένων ὁρῶν ἐν στενῷ μάλιστα. ὁμβρῶν δὲ αὐτὴν ἐς χρόνου μῆκος ἐπικλυσάντων ἐξίτηλος ἐκ τοῦ ἐπὶ πλείστον γεγενημένη μετὰ κινδύνων τὰς διεξόδους παρείχeto ποιῆσθαι τοῖς τῇδε ἰοῦσιν. Ἄπερ ἐπεὶ Ἰουστινιανὸς βασιλεὺς ἀκοῇ ἔλαβεν, ἐν βουλῇ τε καὶ προνοίᾳ πάσῃ πεποιημένος, ἄκεσιν εὐθύς τοῦ κακαῦ εὔρετο, χρήματα γὰρ προέμενος ἀριθμοῦ κρείττονα, ὄρη τε τὰ ἐκείνῃ ἀνέχοντα ἐπὶ μακρότατον ἐκτεμῶν ἅπαντα καὶ νενικηκώς τὰ ἀμύχανα, ὁδὸν ἀμαξήλατον ἐκ τοῦ παραλόγου καὶ τοῦ παραδόξου καὶ τὰ πρόσθεν διεσκενύασατο, διαφανῶς ἐνδειξάμενος ὡς γνώμῃ προμηθεῖ καὶ χρημάτων ὑπερορῶσῃ οὐδὲν ἀνθρώπῳ ἄπορον γένοιτο, τοῦτο μὲν οὖν ταύτῃ ἐξεύργασται.

As one goes from the city of Antioch, which is now called Theopolis, into Cilicia, there is a suburb lying very close to the road, Platanôn by name; and not far from this city lay a path which had long been compressed into a very narrow track by the overhanging mountains; and after being washed by rains for a long time it was destroyed for the most part and afforded only dangerous passage to travellers. When the Emperor Justinian heard of this, he took the matter under careful consideration and straightway found a remedy for the trouble. He spent a sum of money past reckoning, cutting through, for a great distance, all the mountains which rose there to a great height and overcoming impossible obstacles; and he constructed a waggon-road, contrary to all reason and expectation, making flat and open ground of what had previously been broken by precipices, thereby clearly demonstrating that nothing could prove impossible for a man of discerning judgement who was ready to disregard expense. This, then, was done as I have said.

NOTE: Recent field-work by an Austrian team (in 1989) has identified a rock-cut road running from Antakya north-westwards over the mountains (in the vicinity of Serinyol) towards Arsuz (ancient Rhosus) and İskenderun. The road thus runs somewhat south of the Belen pass, the probable location of a *mutatio* (It. Hier. 581.1 Pictanus, *MS V* Platanus).

APP. 6 Julian Epist. 98 (ed. Bidez)

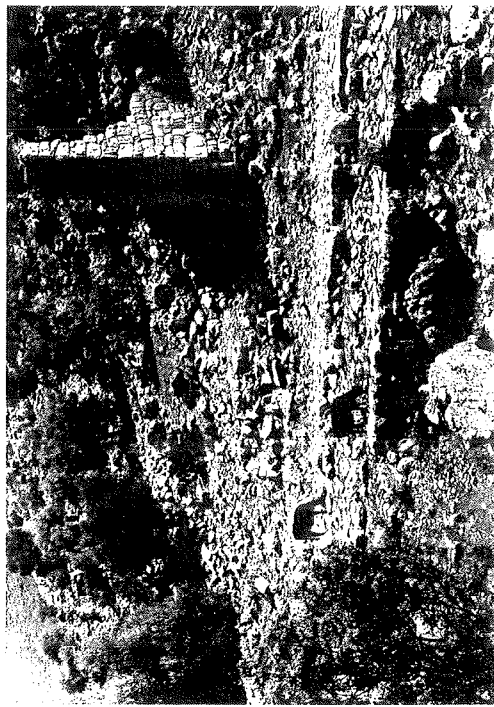
Μέχρι τῶν Λιτάρβων ἦλθον (ἔστι δὲ ἡ κώμη Χαλκίδος) καὶ ἐνέτυχον ὁδῷ λείψανα ἔχουσα χειμαδίων Ἀντιοχίων· ἦν δὲ αὐτῆς, οἶμαι, τὸ μὲν τέλμα τὸ δὲ ὄρος, τραχεῖα δὲ πᾶσα, καὶ ἐνέκειντο τῷ τέλματι λιθοὶ ὥσπερ ἐπίτηδες ἐρριμένοις ἐοικότες, ἵπ' οὐδεμῶς τέχνῃ συγκείμενοι ὄν τρόπον εἰώθασιν ἐν ταῖς ἄλλαις πόλεσι τὰς λεωφόρους οἷον ἐξοικοδομοῦντες ποιεῖν, ἀντὶ μὲν τῆς κονίας πολὺν τὸν χοῦν ἐποικοδομοῦντες, πυκνοὺς δὲ ὥσπερ ἐν τοίχῳ τιθέντες τοὺς λίθους.

I came as far as Litarba (a village on the territory of Chalcis) and I encountered a road where there were traces of an Antiochene winter-camp. Of the road there was, I suppose, a part on marsh and a part on mountain, but everywhere it is rough; and there were lying in the marsh stones which seemed to have thrown there deliberately, lying all-together with no technique, in the manner which in other cities they are accustomed to use, such as for making roads, employing much earth instead of sand (?mortar) and setting stones close together as if in a wall.

NOTE: Julian is here describing the type of road-construction typical of the Balkans and Anatolia, namely, stones roughly laid on earth (see footnotes 18, 21 and 23, above). He recognizes that this is the technique employed elsewhere. The existence (at Litarba, mod. el-Terib) of a roughly cobbled road provides a *terminus a quo* for the Karimi road (c. 7 km NW of Litarba) which must, therefore, have been built between AD 363 and the Arab conquest of Aleppo, AD 636 (see footnote 33, above).



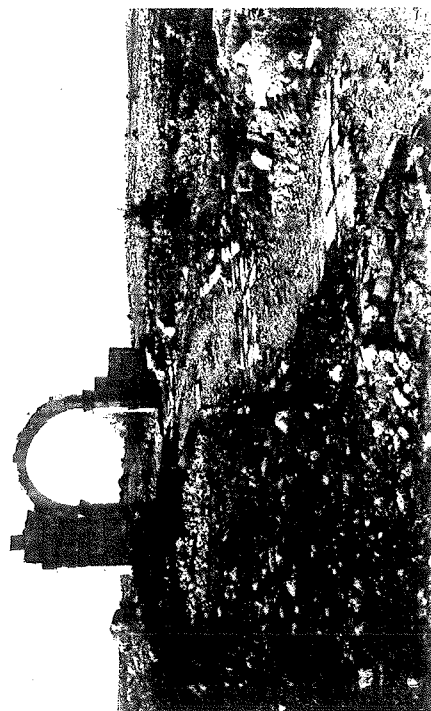
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3

1, 2. SYRIA. Aleppo road near Karimî. 1. View to WNW. — 2. Detail. — 3. CILICIA. Tarsus road and arch near Sağlık, seen from S. — 4. PAMPHYLIA. Via Sebaste in the Döğeme Boğazi, seen from W